Estimating Population: Census, Survey or Administrative Record

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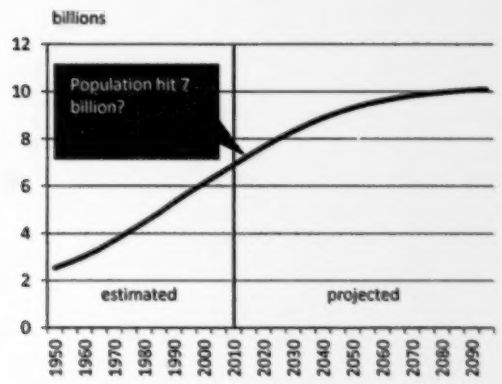
On October 31st, according to the United Nations (UN), the world population topped 7 billion people. However, the organization itself admits "... that its own figures come with a 1% to 2% margin of error. Today's population could actually be 56 million higher or lower than seven billion... ."[1] In fact the U.S. Census Bureau doesn't think the world population will reach 7 billion until March or April of 2012.[2] Though only a small difference, less than one half of one percent, it reflects the inherent uncertainty in estimating and projecting populations.

Estimated and Projected World Population (UN)



Source: United Nations Population Division

In order to estimate the world population each agency uses a variety of sources such as census and survey data, vital statistics and administrative data. Some of these sources are reliable but lack relevance while others are relevant but lack reliability. For example, the 2006 Census counts are reliable but are they relevant in 2011? Conversely the Voter's Registration list which may be as relevant as the most recent election may not be as reliable as the Census. Where the Census is mandatory, registering to vote is voluntary and an individual isn't required to remove themselves from the list if they decide to change residences. The utility of using more than one source is to balance these key attributes.

Estimating BC's Population

While the population of BC is slightly less than 7 billion, according to the latest estimate it was more than 4.5 million as of July 1, 2011, estimating its population is still a challenging task.

Statistics Canada produces a BC level population estimate on a quarterly basis, as well as annual estimates for a limited number of sub-provincial areas.[3] These estimates are based on the most recent Census, post-enumeration surveys and administrative records. An example of administrative data is income tax records. Statistics Canada uses this information to approximate the migration characteristics of the Canadian population.

The province of BC requires population estimates not only for the province as a whole but also for smaller areas within BC such as municipalities and local health authorities. In response, BC STATS uses a combination of the latest estimates from Statistics Canada as well as provincial and federal administrative data to produce population estimates and projections for a variety of sub-provincial areas.

Administrative data generated and collected through the operations of programs and delivery of services can be important tools for

[1] Rahman, R. (2011) *The World at Seven Billion.* Retrieved November 14, 2011 from http://www.bbc.co.uk/news/magazine-15494349

[2] Goodkind, D. (2011) *The World Population at 7 billion.* Retrieved November 14, 2011 from http://blogs.census.gov/censusblog/population/

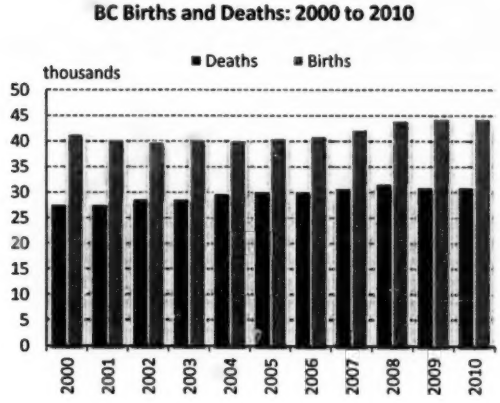
[3] These include census divisions (BC regional districts), census metropolitan areas and economic regions (BC development regions).

demographic studies. However, these data records should be timely, accurate and preferably universal in scope in order to be reliable sources of information.

This article hopes to shed light on some of the administrative data used by BC STATS when analyzing the population and demographic situation of BC.

BC Vital Statistics

Data collected by the BC Vital Statistics Agency (VSA) are an excellent example of timely and accurate information. The BC VSA provides BC STATS with the number of births and deaths that have occurred in the province. It is usually received within three to four months after the reference period and is relatively accurate. This information is used extensively for population analysis and most importantly to measure the natural change (births minus deaths) of the population. It is also used to calculate fertility, mortality and life expectancy which in turn are used as input for the population projections.

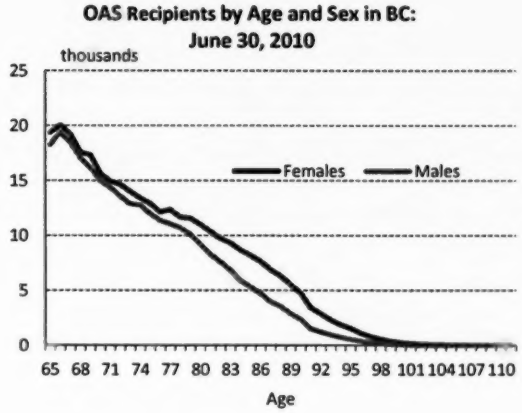


Source: BC Vital Statistics Agency

Federal Old Age Security and Canadian Child Tax Benefit

Data from these two federal programs provide information about the population in two age groups; those who are aged 65 and older and those who are under 18.

Old Age Security (OAS) data are available by single year of age and sex. It is used in analyzing the age, gender and regional distribution of the BC senior population. The results of these analyses are an integral part of the population projection model particularly in forming the base population by sub-provincial region.



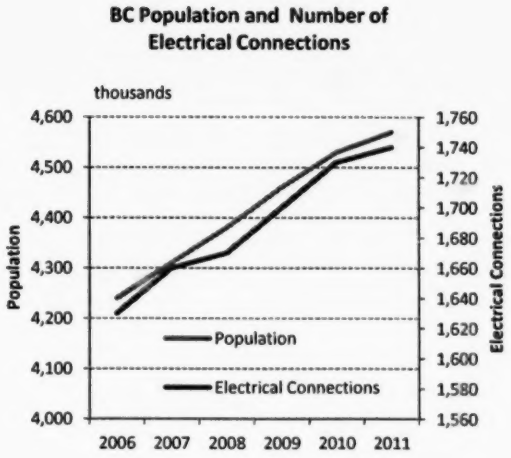
Source: Old Age Security Program, Human Resources and Skills Development Canada

In a similar manner data from the Canadian Child Tax Benefit (CCTB) have been used in a limited capacity to analyze the distribution of the younger population. The limitation is due to the nature of the CCTB; it isn't a universal program so some segments of the population aren't included.

Public Utility Records

Public utility data such as residential electrical connections have been shown to provide useful insights about the formation and dissolution of households in most regions of the province. By calibrating this information with population changes observed in the past, these data can be used as input for developing population estimates.

The following chart plots the number of residential electrical connections alongside the estimated BC population for the last five years.



Source: BC Hydro, Fortis, other independent power companies and Statistics Canada

Annual data from BC Hydro, along with those from Fortis BC and a few other independent power supply companies, are a major indicator used in the BC STATS Generalized Estimation System (GES). GES produces annual population estimates for all BC municipalities and unincorporated areas. These estimates have been used to support many government functions such as determining the transfer of funds between the province and local jurisdictions.

In the past, other information such as telephone data (Telus account records) have been used as indicators for population estimates. Data from Telus are no longer used in the model due to the increasing trend of land lines being replaced by cellular phones. In order for an indicator to be useful, it should accurately reflect the entire population not just a segment.

For more information on GES please see the methodological report "Generalization Estimation System (GES) Small Area Population Estimation"[4] or the Infoline article "GESing Sub-Provincial Population in B.C."[5]

Health Client Registry

Data collected by the Ministry of Heath for the BC Health Client Registry are another important input for the GES. By calibrating the population changes in the registry with changes in residential electrical connections, the GES is able to produce population estimates for the corresponding year. The advantage of using data from the Health Client Registry is that it covers the majority of the residents living in the province, and information regarding client residences is relatively up to date. The relevance of this data for the GES system is indicated by the degree of statistical significance reported by the regression analysis within the estimation model. Data from the Health Client Registry are considered to be one of the most important sources for analyzing population distribution and growth in small areas of BC.

[4] BC Stats. August 2011.
http://www.bcstats.gov.bc.ca/data/pop/pop/MethodGES_Aug2011.pdf
[5] Cocco, A. March 5, 2010.
http://www.bcstats.gov.bc.ca/releases/info2010/in1009.pdf